Paper No. 14

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte HENRY W. BONK and DAVID GOLDWASSER

Appeal No. 2001-0168
Application No. 09/170,790

ON BRIEF

Before WILLIAM SMITH, WARREN, and POTEATE, Administrative Patent Judges.

POTEATE, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 from the examiner's refusal to allow claims 1-43 and 64-66. Claims 44-63 are pending but have been withdrawn from consideration as directed to a non-elected invention. See Final Rejection, Paper No. 5, mailed July 26, 1999, page 2.

Claims 1, 2 and 10 are representative of the subject matter on appeal and are reproduced below:

1. A barrier membrane having improved resistance to undesired gas permeation, comprising:

a first layer including a combination of at least one aliphatic thermoplastic urethane and a copolymer of ethylene and vinyl alcohol; and

a second layer including a thermoplastic urethane;

wherein hydrogen bonding occurs along a segment of the membrane between the first and second layers, and further wherein said barrier membrane is sealed and is inflated with a gas toward which said membrane has a gas transmission rate value of about 10.0 cc/m^2 x atm x day or less.

2. The barrier membrane according to Claim 1, wherein said first layer includes up to about 50 wt.% of aliphatic thermoplastic urethane.

10. The barrier membrane according to Claim 1, wherein said first layer includes:

(a) 50 wt.% to about 97 wt% of at least one ethylene and vinyl alcohol copolymer;

(b) 3 wt.% to about 50 wt.% of at least one aliphatic thermoplastic urethane; and

(c) up to about 3.0 wt.% of one or more aromatic urethanes;

wherein the total constituency of said first layer is equal to 100.0 wt.%.

The reference relied upon by the examiner is:

Moureaux	5,036,110	Jul. 30, 1991

Ground of Rejection[1]

Claims 1-43 and 64-66 stand rejected under 35 U.S.C. § 103 as unpatentable over Moureaux.

We affirm as to claims 1, 5-9, 17-21, 23, 27-30, 32, 36-40, 42-43 and 64-66. We reverse as to claims 2-4, 10, 14-16, 22, 24-26, 31, 33-35 and 41.

Background

The invention is directed to a barrier membrane having improved resistance to undesired gas permeation and to a method of producing a laminated barrier membrane useful for controlling gas permeation therethrough. Such barrier membranes are, for example, useful in vehicle tires and sporting goods, accumulators used on heavy machinery and cushioning devices used in footwear. Specification, page 2, lines 1-6.

The barrier membrane of the invention includes first and second layers. The first layer is a combination of at least one aliphatic thermoplastic urethane and a copolymer of ethylene and

[1] The rejections of claims 1-43 and 64-66 under 35 U.S.C. § 112 first and second paragraphs have been withdrawn in view of the amendment after final rejection, Paper No. 9, received March 2, 2000. See Examiner's Answer, Paper No. 12, page 2, paragraph (6).

vinyl alcohol. The second layer includes a thermoplastic urethane. The first and second layers are held together by hydrogen bonding. In accordance with the method of the invention, the laminated barrier membrane is preferably manufactured by extruding the layers.

Discussion

Appellants assert that "[e]ach of the present claims is patentable over the Moureaux reference because the Moureaux reference fails to teach, mention or suggest hydrogen bonding between layers of a barrier membrane." Appeal Brief, Paper No. 10, received March 2, 2000, page 9. Appellants appear to concede that Moureaux teaches a barrier membrane having layers containing the same chemical components as the claimed first and second layers. See id., pages 9 and 10. However, appellants maintain that the structure of Moureaux's first layer is such that hydrogen bonding would not occur, while the structure of appellants' first layer allows for hydrogen bonding to occur along a segment of the membrane between the first and second

layers.[2] Appeal Brief, page 10. In particular, appellants' first layer is such that the ethylene vinyl alcohol copolymer is present at the layer surface. Id. In contrast, Moureaux teaches that the ethylene-vinyl alcohol copolymer, as part of the graft polymer, is embedded as eyelets in the polyurethane. See id. (referencing Figure 1 of Moureaux). Appellants argue that the embedded copolymer is not in contact with adjacent membrane layers and, therefore, hydrogen bonding cannot occur at the interface of the layers. See id.

In deciding patentability issues under 35 U.S.C. § 103 "[a]nalysis begins with the key legal question -- *what* is the invention *claimed*?" Panduit Corp. v. Dennison Mfg. Co., 810 F.2d 1561, 1567-68, 1 USPQ2d 1593, 1597 (Fed. Cir.), cert. denied, 481 U.S. 1052 (1987). In determining the patentability of claims, the Patent Office gives claim language its "broadest reasonable interpretation" consistent with the specification and claims. In re Morris, 127 F.3d 1048, 1054, 44 USPQ2d 1023, 1027 (Fed. Cir. 1997).

[2] The examiner acknowledges that "[t]he claimed gas transmission rate is not disclosed" in Moureaux, but found that the membrane "would inherently display a gas transmission rate within the claimed maximum period." Examiner's Answer, page 3. Appellants have not traversed the examiner's finding.

As pointed out by the examiner, "[t]he claims merely define a layer of a combination of a polyurethane and ethylene-vinyl alcohol copolymer without specifying the position of the copolymer within the layer." Examiner's Answer, page 7. Moreover, the claims do not specifically recite that the hydrogen bonding occurs "between a copolymer of ethylene-vinyl alcohol (EVOH) of the first layer and a thermoplastic polyurethane (TPU) of a second layer." See Appeal Brief, page 9. Rather, the claims merely require that hydrogen bonding occur along a segment of the membrane between the first and second layers.[3]

Although the initial burden of establishing a prima facie case of obviousness rests on the examiner, see In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992), the PTO can require an applicant to prove that a prior art product does not necessarily or inherently possess the characteristics of the claimed product where the claimed and prior art products are

[3] According to appellants' specification, "it is *believed* that significant bonding occurs as the result of available hydrogen molecules being donated by the vinyl alcohol groups of the ethylene-vinyl alcohol co-polymer along the length of the laminated membrane and hydroxyl and urethane carbonyl groups, or simply the available polar groups of aliphatic thermoplastic urethane." Specification, page 32, lines 6-10 (emphasis added).

identical or substantially identical, or are produced by identical or substantially identical processes. In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977).

In arguing that Moureaux's structure could not exhibit hydrogen bonding, appellants rely, in particular, on the embodiment shown in Figure 1 of Moureaux wherein the ethylene-vinyl alcohol copolymer is *not depicted* as being present at the surface of the membrane layer. See supra, page 5. The examiner concludes that "[t]he ethylene-vinyl alcohol is not limited to a location within the polyurethane but is uniformly distributed throughout the membrane, including the surface" (Examiner's Answer, page 6).

We find that Moureaux discloses at least one film of a graft polymer, formed by the reaction of thermoplastic polyurethane with a copolymer of ethylene and vinyl alcohol (as described in connection with **FIG. 1**, see Moureaux, column 6, lines 11-12), which is arranged between two layers **3** of a thermoplastic polyurethane. See id., lines 10-16. The layer containing the co-polymer may be made by *mixing* the thermoplastic polyurethane and the co-polymer. See id., claim 2. Specifically, Moureaux teaches that these materials may be mixed for a few minutes at a temperature between 150 ˚C and 250 ˚C

(302 ˚F - 482 ˚F). Id., column 7, lines 10-13. The membrane is then formed by incorporating the film between the layers of thermoplastic polyurethane in a bi-material injection press. Moureaux, column 7, lines 13-16.

Moureaux is silent as to how bonding is effected between the layers in the aforementioned embodiment. However, since Moureaux utilizes the same starting materials and temperatures as appellants (300 ˚F to about 450 ˚F, Specification, page 39, lines 17-19) (see Final Rejection, Paper No. 8, mailed December 6, 1999, page 4), it would be expected that Moureaux's process would produce a structure which falls within the limitations of claim 1. Thus, we agree with the examiner's conclusion that the gas-barrier membrane of Moureaux inherently exhibits hydrogen bonding between the layers. See Examiner's Answer, page 3. See Lamberti, 545 F.2d 747 at 750, 192 USPQ at 280 ("[T]he question under 35 U.S.C. § 103 is not merely what the references expressly teach, but what they would have suggested to one of ordinary skill in the art at the time the invention was made.")

Appellants separately argue the patentability of dependent claims 2-4, 10, 14-16, 22, 24-26, 31, 33-35 and 41 which define barrier membranes having 50 weight percent or less thermoplastic

urethane in the first layer. Appeal Brief, page 3. Appellants also separately argue the patentability of claims 10, 22, 31 and 41 which are directed to barrier membranes that include 50-97 weight percent of ethylene-vinyl alcohol copolymer and 3-15 weight percent of thermoplastic urethane in the first layer.[4]

Appellants assert that all of these claims define over Moureaux which "teaches that the polyurethane is at least 80 weight percent of the graft copolymer layer." Appeal Brief, page 11. According to appellants, the examiner has misinterpreted Moureaux as disclosing two distinct layers one of which contains a minority of ethylene-vinyl alcohol copolymer and another of which contains a majority, i.e., 50-95% of ethylene-vinyl alcohol copolymer. See Reply Brief, Paper No. 12, received May 23, 2000, page 1. We agree.

Claims 2-4, 14-16, 24-26, and 33-35 require that the barrier membranes include 50 weight percent or less thermoplastic urethane in the first layer. Each of claims 10, 22, 31 and 41 specify that the first layer of the claimed membrane includes "50 wt.% to about 97 wt% of at least one ethylene and vinyl alcohol"

[4] We note that the presence of "3.0 wt.% of one or more aromatic urethanes" as recited in these claims is merely optional since it is preceded by the language "up to."

and "3 wt.% to about 50 wt." of at least one aliphatic thermoplastic urethane." Moureaux discloses a membrane comprising a film 2 of a graft polymer formed by the reaction of thermoplastic polyurethane with ethylene-vinyl alcohol copolymer arranged between two layers 3 of thermoplastic polyurethane membrane. See, supra, pages 7-8. Film 2 may be obtained by mixing these components "in a proportion of 50% to 95% of EVOH *with respect to* the thermoplastic polyurethane" to form a graft polymer. Moureaux, column 6, lines 24-25 (emphasis added). In the *resulting film 2*, the amount of ethylene-vinyl alcohol copolymer with respect to the first material is in the range of 5-20%. Id. column 2, lines 25-39 (emphasis added). Thus, Moureaux does not render obvious those claims which require that the barrier membrane include 50 weight percent or less thermoplastic urethane or those claims which require that the first layer include 5 wt.% of at least one ethylene and vinyl alcohol.

In sum, we conclude that the examiner has established a prima facie case of obviousness with respect to claims 1, 5-9, 17-21, 23, 27-30, 32, 36-40, 42-43 and 64-66 which appellants have failed to rebut. The rejection is affirmed as to these claims. The examiner has failed to establish a prima facie case

of obviousness with respect to claims 2-4, 10, 14-16, 22, 24-26, 31, 33-35 and 41. We reverse the rejection as to these claims.

Other Issues

1. 37 CFR § 1.192(c)(7) (July, 1999) provides that

> for each ground of rejection which appellant contest and which applies to a group of two or more claims, the Board shall select a single claim from the group and shall decide the appeal as to the ground of rejection on the basis of that claim alone unless a statement is included that the claims of the group do not stand or fall together and, in the argument under ¶ (c)(8) of this section, appellant explains why the claims of the group are believed to be separately patentable.

Precisely how appellants view the patentability of the claims over Moureaux is unclear from the stated grouping of the claims. Claim 2 is grouped with claim 1. However, claim 2 is also grouped separately from claim 1. Similarly, claims 10, 22, 31 and 41 are indicated as standing or falling with claim 2 and, yet, are separately grouped. Since appellants appear to have made a bonafide attempt to separately argue the patentability of three groups of claims, we have separately considered the patentability of each of claims 1, 2 and 10.

2. In the event that appellants elect to continue prosecution of this application, claims 31 and 41 should be amended to correct the preamble. In particular, the preambles

currently recite "A barrier membrane according to" claims 23 and 32, respectively. Claims 23 and 32 recite "A method for producing a laminated barrier membrane. . . ."

Time Period for Response

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED-IN-PART

WILLIAM F. SMITH Administrative Patent Judge	)
CHARLES F. WARREN Administrative Patent Judge	) BOARD OF PATENT APPEALS AND INTERFERENCES
LINDA R. POTEATE Administrative Patent Judge	)

LRP/lbg

Appeal No. 2001-0168
Application No. 09/170,790

HARNESS, DICKEY & PIERCE
PO BOX 828
BLOOMFIELD HILLS MI 48303